The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHUNG-CHU CHEN, CHEN-KUEI CHUNG
and CHUN-JUN LIN

Appeal No. 2004-0680
Application No. 10/057,026

ON BRIEF

Before HAIRSTON, MCQUADE and BAHR, Administrative Patent Judges.

MCQUADE, Administrative Patent Judge.

DECISION ON APPEAL

Chung-Chu Chen et al. appeal from the final rejection of claims 11 through 20.[1] Claims 1 through 10, the only other claims pending in the application, stand withdrawn from consideration pursuant to 37 CFR § 1.142(b).

THE INVENTION

The invention relates to "a thermal bubble type inkjet head that is equipped with a rapid ink refill mechanism and off-

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[1] Claim 11 has been amended subsequent to final rejection.

shooter heater" (specification, page 1). Representative claim 11 reads as follows:

11. A thermal bubble inkjet head having off-shooter heaters and a rapid ink refill mechanism comprising:

a silicon substrate having a top surface and a bottom surface;

a first insulating material layer of at least 1000 Å thick on said top surface;

a funnel-shaped manifold formed in said silicon substrate;

two spaced-apart heaters formed on said first insulating material layer on said top surface;

two interconnects formed of a conductive metal each in electrical communication with one of said two spaced-apart heaters;

a third insulating material layer on top of said two spaced-apart heaters and said first insulating material layer;

a first photoresist layer of at least 2000Å thick on top of said third insulating material layer;

a primary and an auxiliary ink chamber formed in said first photoresist layer in fluid communication with each other and with said funnel-shaped manifold;

a metal seed layer on said first photoresist layer and an inkjet orifice formed in said metal seed layer; and

a Ni layer on top of said metal seed layer with an aperture formed therein in fluid communication with said inkjet orifice.[2]

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[2] The recitation in claim 11 of the "third" insulating material layer is somewhat discordant in that the claim does not recite any "second" insulating material layer. In the same vein, the reference in dependent claim 14 to "said first and second insulating material layers" lacks a proper antecedent basis. In the event of further prosecution, suitable steps should be taken

THE PRIOR ART

The references relied on by the examiner to support the final rejection are:

Taub et al. (Taub)	5,308,442	May 3, 1994
Mitani et al. (Mitani)	5,831,648	Nov. 3, 1998
Hawkins et al. (Hawkins)	6,214,245	Apr. 10, 2001
Moon et al. (Moon)	2002/0012027	Jan. 31, 2002
Leban et al. (Leban) (European Patent Document)	0 317 171	May 24, 1989

THE REJECTIONS

Claims 11, 12, 14 through 17 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Leban in view of Mitani, Taub and Hawkins.

Claims 13, 18 and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Leban in view of Mitani, Taub, Hawkins and Moon.

Attention is directed to the brief (Paper No. 9) and answer (Paper No. 10) for the respective positions of the appellants and examiner regarding the merits of these rejections.[3,4]

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to correct these informalities.

[3] Although the statements of the second rejection in the final rejection (Paper No. 5) and answer do not include claim 19, the accompanying explanations of the rejection indicate that the omission was inadvertent.

[4] In the final rejection, claims 11 through 20 also stood rejected under 35 U.S.C. § 112, second paragraph, as being

DISCUSSION

As framed and argued by the appellants (see pages 5 through 9 in the brief), the dispositive issue in this appeal is whether the applied prior art references would have rendered obvious a thermal bubble inkjet head meeting the limitations in independent claim 11 requiring a funnel-shaped manifold and primary and auxiliary ink chambers in fluid communication with each other and the funnel-shaped manifold. The appellants do not otherwise challenge the examiner's findings as to the scope of the appealed claims, the teachings of the prior art references and the differences therebetween, or the accompanying conclusion that it would have been obvious to a person having ordinary skill in the art to combine the references so as to meet the limitations in the claims (see pages 4 through 8 in the answer).

As for the issue in dispute, Leban, the examiner's primary reference, discloses a thermal bubble inkjet head comprising, inter alia, a silicon substrate (10, 32), a photoresist (e.g., Riston) barrier layer (12, 48) overlying the substrate and defining an ink injection chamber (14, 52) and a drop ejection chamber (16, 54) in communication with one another, a source of

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indefinite. The examiner has since withdrawn this rejection in light of the subsequent amendment of claim 11 (see page 6 in the answer).

ink supply defined at least in part by the substrate (see the ink flow path arrows in Figure 1A and Figure 5), and a flow input port (26) in the barrier layer providing communication between the ink injection and drop ejection chambers and the source of ink supply.

Leban's drop ejection chamber and ink injection chamber respectively constitute a primary ink chamber and an auxiliary ink chamber as recited in claim 11. This goes without question by the appellants. Furthermore, given the overall context of the Leban disclosure, the source of ink supply would have suggested, if it does not actually teach, a manifold in communication with the ink injection and drop ejection chambers for supplying ink thereto.[5] In this regard, Leban's background discussion of the prior art and brief description of the drawings (see page 2) indicate that the source of ink supply provides ink to a plurality of ink injection and drop ejection chambers. Hence, the source of ink supply at least suggests a "manifold" to the broad extent disclosed and claimed by the appellants. As conceded by the examiner (see page 4 in the answer), however, Leban's admittedly brief disclosure of the source of ink supply

[5] The record does not support the appellants' assertion of an admission by the examiner that "Leban et al does not teach a manifold at all" (brief, page 7).

does not respond to the limitation in claim 11 calling for the manifold to be "funnel-shaped."

Taub discloses a thermal ink-jet printhead 13 comprising a plurality of drop ejection chambers 15 in communication with a common ink fill slot 18, i.e., a manifold, formed in a silicon wafer 12. As shown in Figures 4c-4f, the ink fill slot has a tapered pyramidal shape, i.e., a funnel-shape (see column 5, lines 26 through 30). Taub teaches that such ink fill slot is capable of being precisely manufactured in terms of its geometry and alignment (see column 2, lines 22 through 24; and column 4, lines 23 through 28) and has a configuration which provides the requisite volume of ink at increasingly higher frequencies of operation (see column 2, lines 25 through 28).

In proposing to combine Leban and Taub to reject claim 11, the examiner concludes that it would have been obvious at the time the invention was made to a person having ordinary skill in the art "to have provided Leban with a funnel shaped manifold for the purpose of adequately responding to ink volume demands, as taught by Taub" (answer, page 5).

The appellants counter that this conclusion is unsound, essentially because "**none of the two references**, either singularly or in combination thereof, **teaches a funnel-shaped**

manifold that is in fluid communication with both a primary and an auxiliary ink chamber" (brief, pages 7 and 8).

It is of no moment that neither Leban nor Taub teaches a thermal bubble inkjet head comprising a funnel-shaped manifold and primary and auxiliary ink chambers in fluid communication with each other and the funnel-shaped manifold. Non-obviousness cannot be established by attacking references individually where, as here, the rejection is based upon the teachings of a combination of references. In re Merck & Co., Inc., 800 F.2d 1091, 1097, 231 USPQ 375, 380 (Fed. Cir. 1986). In this regard, the test for obviousness is what the combined teachings of the references would have suggested to those of ordinary skill in the art. In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). In the present case, Taub's description of the above noted advantages afforded by the use of a funnel-shaped ink fill slot or manifold in a thermal inkjet head would have furnished the artisan with ample suggestion or motivation to employ such a manifold in the thermal inkjet head disclosed by Leban, thereby resulting in an inkjet head meeting the limitations in claim 11 argued by the appellants. Thus, the appellants' position on appeal that the subject matter recited in independent claim 11,

and dependent claims 12 through 20, would not have been obvious within the meaning of § 103(a) is unpersuasive.

We shall therefore sustain the standing 35 U.S.C. § 103(a) rejection of claims 11, 12, 14 through 17 and 20 as being unpatentable over Leban in view of Mitani, Taub and Hawkins, and the standing 35 U.S.C. § 103(a) rejection of dependent claims 13, 18 and 19 as being unpatentable over Leban in view of Mitani, Taub, Hawkins and Moon.

SUMMARY

The decision of the examiner to reject claims 11 through 20 is affirmed.

AFFIRMED

KENNETH W. HAIRSTON)
Administrative Patent Judge)
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JOHN P. MCQUADE) BOARD OF PATENT
Administrative Patent Judge) APPEALS
) AND
) INTERFERENCES
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JENNIFER D. BAHR)
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JPM/gjh

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